# Safety and Buildings Division Commercial Buildings Plan Submittal Checklist

**What information do you need to include as part of your building plan submittal package?**

1. Four complete bound sets of plans (minimum), or one complete set of plans, and three copies of the cover sheet of the plans, which must include a complete sheet index. The complete set(s) and/or cover sheets must all include the original seal and signature of the designer(s). After approval it will be the designer's responsibility to attach the appropriate plans sheets to the approval-stamped index sheets.
2. One set of specifications (if not included on the drawings themselves).
3. Completed application form SBD-118 with signatures as needed.
4. Fees as determined from online appointment scheduling or application form. (Note that vary depending if the project is to be constructed in a "certified municipality". Go to the S&B WebSite for a list of commercial building delegated municipalities, http://commerce.wi.gov/SB/SB-CommercialBuildings DelegatedMunicipalities.html.
5. Sufficient calculations and information must be submitted to substantiate that the plan documents conform to the code (structural, energy, and HVAC).

**Footing/ Foundation Submittals** (Optional as separate submittal prior to full plans.)

**A. Design Load Key Plan** (Ensure thorough coordination of structural design before construction begins.)
   1. Live loads
   2. Dead loads
   3. Wind loads
   4. Snow loads
   5. Special loads (drifting, equipment, steeples, shear walls, etc.)
   6. Indication of load transfer down to the foundation

**B. Site Plan**
   1. Distances to property lines, existing buildings, streets, etc.
   2. Dimensioned streets or fire department access roads
   3. Pertinent recorded easements on adjoining property
   4. Type of construction of existing buildings

**C. Schematic Floor Plans, Elevations, Wall Sections**
   1. Exit stair and exit door locations
   2. Fire wall locations
   3. Window and fire department access openings

**D. Calculations or Reference Tables**
   See section E under building submittal on following pages
   If submitting reference tables, please highlight loading and member used in copy of that table.

**E. Worksheets**

Several of the worksheets in this kit may be helpful to facilitate footing and foundation approvals, including:
   1. Road Access Worksheet,
   2. Structural Design Worksheet, and
   3. Lateral Load Resisting Systems and Connections Worksheet.

**F. Footing/Foundation Requirements;**

1. Soil properties (type of soil and bearing capacity of soil)
2. Footing and foundation sizes (width, length, and depth)
3. Reinforcing steel (location, size, grade, details of hooks and splices, etc.)
4. Anchor bolt sizes, locations, embedment type (hooked, tack-welded nut, etc,), projections above top of footings/foundations, and strengths and capacities of anchor bolts
5. Pole embedment calculations (if applicable) for both side and end wall poles
6. Retaining wall details as applicable (width, length, and depth) and reinforcement
7. Pile foundation details (type of piles used, depth, size, and material strengths) as applicable
8. Consideration of special loads such as buoyancy and hydrostatic loads as applicable
9. Perimeter insulation
10. Blasting permits (if needed)

**H. Footing Sizing Calculation**

1. Calculation using critical load case for each different size footing shown on the plans
2. If it is a pole building, then at least one sample pole embedment calculation must be shown for the side wall poles and end wall poles, as well as the footing sizing calculation for such poles
3. Calculations must include a check of soil bearing capacity as well as shear and bending resistance of the footing

**<u>Building Submittal (new and addition)</u>**

**A. Footing/Foundation Plans**

See all items from footing and foundation submittals above

**B. Site Plans (plan size plus 8½ x 11 -inch file copy for malls)**

1. Distances to property lines, buildings, streets, etc.
2. Dimensioned streets or access roads
3. Pertinent recorded easements on adjoining property
4. Type of construction of existing buildings
5. Barrier-free parking and access paths (include slopes)
6. Court widths and imaginary lot line locations

**C. Floor Plans**

1. Uses and sizes of rooms
2. Exit location(s), exit lights, door swing directions, ramp, and stair details
3. Automatic fire sprinkler requirements (Chapter 9 by uses and occupancy, height above or below grade access, hazard protected areas, etc.), type of system/design standard (i.e. NFPA 13), extent of coverage, and required separations between sprinkler protected and unsprinkled areas
4. Fire rated designs, required for issues such as area limits, occupancy, class of construction, sprinkler limits (specify each as fire wall, smoke barrier, fire barrier, or fire partition)
5. Window and door schedules (sizes, fire ratings, safety glaze, undercutting, etc.)
6. Sanitary facilities (types, numbers, and locations)
7. Stair and shaft enclosures
8. Isolation of hazards (amount and location of hazardous materials)
9. Smoke detectors (if needed)
10. Fire extinguishers, fire alarms (if needed)
11. Barrier-free requirements (see separate section later in this booklet)
12. Occupancy special requirements (usually in Chapter 4)

**D. Elevations/Sections**

1. Exterior grade, floor levels, and roof elevations
2. Accessibility features
3. Exterior openings
4. Egress details (fire escape, assisted rescue platform, stairs)
5. Exterior finish
6. Depth of foundations
7. Stair, ramp, handrail and guard construction
8. Headroom clearances
9. Construction materials used (structure, insulation, sheathings and finishes)
10. Structural connections required at load transfers
11. Floor framing and wall headers
12. Wind bracing

**E. Building Plan Structural Submittals:**

*Please note that the following list of structural submittal requirements is not all-inclusive and S&B may request additional information and/or calculations on a case by case basis.*

1. Live loads (floor, roof, crane, etc.)
2. Itemized dead loads
3. Snow loads (including unbalanced)
4. Wind loads for main wind-force-resisting system and components and cladding loads
5. Seismic design loads
6. Special loads (drifting snow, equipment, steeples, signs, shearwalls, etc.)
7. Continuous load transfer path to foundations – required connections and consideration for uplift and overturning
8. All design loads shall be shown on the plans and within the calculations. Sample calculations submitted shall show how the design loads were calculated. The following information, as a minimum, must be provided on the plans and/or calculations in order to determine the snow, wind, and seismic design loads (where applicable):
    a. Terrain category and minimum wind design speed
    b. Exposure category and factors (snow and wind)
    c. Importance categories and factors (seismic, snow and wind)
    d. Soil site class determination
    e. Seismic use group and design category
    f. Design ground snow load

**F. Framing Requirements (floor and roof framing);**

1. Member sizes, spacing, material properties and bridging requirements
2. Materials (wood, steel, trusses, pre-cast, etc.), applicable adjustment factors, and allowable stresses of materials used (bending, shear, compressive, etc.) should be noted or in specifications
3. Critical bearing, anchorage, and connections needed (when over code table minimum)
4. Shear wall details (if applicable) with at least: location, connector spacing, materials, design capacity of shear wall, and connections of shear wall to roof diaphragm, drag struts, and footings/foundations
5. Calculations verifying capacity of floor/roof joists and headers supporting joists
6. Calculations verifying capacity of diaphragms (include any adjustments) or highlighted table
7. Structural calculations corresponding to framing plans
8. Stud and pole design calculations as applicable
9. Calculations for load transfer to foundations from roof and/or floor framing elements to the foundations, including design of all transferring elements (i.e.: columns, foundations, etc.)
10. *Typical (for each joist size/span) joist sizing calculations under the critical loading condition and typical supporting member/element sizing calculation must be included in the submitted structural*

*calculations. Typical door/window header calculations taken at the worst case must be submitted. If diaphragm design is utilized, then typical horizontal diaphragm and shearwall design calculations must be submitted showing loading is less than system design capacity for the system/connections shown on the plan.*

**G. Masonry Construction Requirements;**

1. Compliance with all empirical masonry requirements or submitted engineered masonry calculations
2. Masonry properties [material, thickness, and type (hollow or solid)]
3. Mortar type and properties of grout
4. Lateral supports of masonry walls
5. Reinforcement details (type, location, and strength)
6. Bonding requirements (type of bond and type of tie assemblies)
7. Anchorage of masonry to structural elements (for lateral support of masonry), roof or floor anchorage to masonry bearing walls, and nonload bearing exterior or interior masonry anchorage to structural frame
8. Details of bearing on masonry or of masonry bearing on other materials (type and size needed)
9. Veneer details (material, thickness, backing/bearing supports, attachment method)
10. *If using engineered masonry, then complete masonry calculations shall be submitted.*

**H. Structural Component Plan Submittals:**

Structural components are those parts of a building structure that are pre-manufactured prior to arrival at the construction site. These include:

1. Wood trusses (roof and floor)
2. Precast concrete (slab and wall panels)
3. Pre-engineered metal buildings
4. Laminated wood beams
5. Steel joist girders (and special loaded steel joists)
6. Structural steel (if not fully designed and detailed on building plans)

S&B requires that plans and calculations for these components be submitted prior to their manufacture and delivery. All component plans submitted to S&B must be complete erection drawings "For Construction". There are two options available for component plan submittals:

1. Submit component plans with the building plans. If the component plans are submitted with the initial building plan set, then 1 component plan shall be attached to each building plan, creating full plan sets.
2. Since, in many cases, the manufacturer of the components is not known at the time of original plan submission, the component plans and calculations may be submitted at a later date. If this option is chosen, the following procedure must be followed:
    a. Submit <u>one</u> set of a properly signed and sealed structural component plans and applicable calculations. The signature and seal on the component drawings is to be that of the component designer (not the building designer). A component designer need not be a state of Wisconsin registered professional.
    b. Submit a <u>copy</u> of the original plan approval application form SBD-118 with an <u>original</u> signature of the building designer on the component submittal line of the application form, if over 50,000 cubic feet. The building plan approval letter will indicate whether the component plan is to be sent to the original reviewer or to the Madison office. **Please send plans to the appropriate office location.**
    c. A component submittal fee of $100 is to be included.
    d. Component plans shall bear an indication of review by the building designer (if different from the structural component designer). A statement to the effect, *"I have reviewed against my overall building design and intent and find the component plan acceptable"* with the designer's signature, is acceptable. An original seal with signature is NOT appropriate if the building designer is other than the component designer therefore, we are asking for this *"indication of review"* instead. A signed cover letter to this effect is also acceptable.

d. **NOTE**: Truss plans that are part of a pole building design **may not** be submitted separately as a component. One set of truss plans shall be attached to each building plan set as is required. (*Thus a minimum of four complete plan sets must be submitted for review*.)
e. Indication of review by the building designer (if different from the structural component designer) shall be provided on actual component plan submitted. Such as a statement to the effect *"I have reviewed against my overall building design and intent and find the component plan acceptable"* (or words to that effect) with the designer's signature. An original seal with signature is NOT appropriate if the building designer is other than the component designer therefore, we are asking for this *"indication of review"* instead. A cover letter to this effect may also be acceptable.
f. An identical component set (also bearing *indication of review* by the building designer) shall be maintained at the job site. It must be available to state or municipal inspectors and others who have need of this information. Designer should attach state letter of review (or non-review) to this set.
g. NOTE: The erection plan may be properly signed and sealed or provided with a signature of an engineer or architect and a stamp indicating review of the erection plan. Changes to the previously submitted and approved framing plan **must** be properly signed and sealed.
h. Owners and designers should also be prepared to present a third similarly noted component plan to the local building inspector or permitting authority (when required by that municipality for permitting authority, inspection, or other purposes).

**I. Specific Component Submittal Requirements:**

1. **Truss plan requirements:**
   a. Owner and address of job
   b. All applicable design loads shown on plans (if calculations are submitted separate from truss plans)
   c. Framing plans provided with truss submittal, if they were not provided at the time of building review or if such did not provide the following information:
      i. Location and designation of all trusses
      ii. Bearing and anchorage conditions
   d. Individual truss plans (shape and sizes)
   e. Lumber species and grade of all members if wood truss and material properties if open web steel truss
   f. Web and chord bracing requirements (locations)
   g. Bearing locations, sizes, and reactions
   h. Member connections, plate types, sizes, gage, orientation, and locations
   i. Capacity of connector plates (in pounds per nail or pounds per square inch) and required number of nails or square inches of plate area required on each member of each joint.
   h. A valid independent/third party evaluation service (i.e. ICC ES) approval number or WI material approval number for connector plates, or complete structural calculations for connector plates shall be provided on the plans
   i. Adjustment factors (load duration, wet service factor, repetitive member factor, etc.)
   j. Truss calculations for all trusses, including: gable, valley, piggy-back, side and end jack designs. Calculations to include: 1) truss design loads [dead, live, lateral, special loads (drift, equipment, others), etc.]; 2) combined effects of axial loads and bending moments on top and bottom chord members; 3) stress diagrams or calculations to determine axial loads; 4) complete connector plate calculations or a valid connector plate approval number (see above); 5) joist hanger and anchorage calculations (minimum bearing required); 6) calculations and connections used to resist induced wind suction on open and enclosed structures; and 7) uplift calculations if trusses are used on a canopy or other open structure.

*If current and valid approval number for the metal plate connector is indicated on the truss plans, then the wood truss calculations would have to include all of the information required within the materials approval. If the truss plans do not indicate a current or valid metal connector plate approval number, then all of the requirements specified above will have to be provided.*

2. **Precast concrete plan requirements:**
    a. Bearing and anchorage conditions/details(clearly show restrained or non-restrained ends in accordance with ASTM E119)
    b. Owner and address of job
    c. All applicable design loads shown on plans
    d. Details of schedules on plans for planks, beams, and columns
    e. Plank locations and designations of all precast members
    f. Width, depth/thickness, lengths, and camber of precast members
    g. Strand or reinforcement sizes, locations, and concrete cover thickness
    h. Embedments for connections to other structural members/systems
    i. Stirrup sizes and locations (if required)
    j. Fire resistive rating of pre-cast members based on restraint condition (if applicable)

    *Complete structural calculations for typical members and connections in accordance with referenced standards* .

3. **Metal building plan requirements:**
    a. Design loads on plans and complete structural calculations for all beams, columns, girts, purlins, bracing, connections, roof and wall panels, etc.
    b. Owner and address of job
    c. All beam, column, girt, and purlin locations and designations on plans
    d. Component plan requirements: 1) purlin and girt sizes and properties, 2) diagonal bracing locations and materials, 3) critical connections between load transferring members, 4) column, beams, and end-wall design and details, and 5) critical dimensions of webs and flanges of all members at the base, haunch, ridge, and any other location where the member size changes

    *Complete structural calculations including analysis and material design (noted above as point a.) for typical members and connections in accordance with referenced standards. Structural calculations should pay particular attention to any rack storage system that imparts loads to the metal building or supports the metal building (consult the Rack Manufacturers Institute for design information).*

4. **Laminated wood plan requirements:**
    a. Owner and address of job
    b. Framing plans, if they were not provided at the time of building review or if such did not provide the following information:
        i. Location and designation of all laminated wood members
        ii. Bearing and anchorage conditions
    c. Laminated wood plans
        i. Width, depth/thickness, length, and camber of members
        ii. Lumber species and grade of all members
        iii. Sketch showing member geometry
    d. All applicable design loads (live, dead, special loads, etc.)
    e. Bearing locations and reactions
    f. Minimum bearing sizes required
    g. Adjustment factors (load duration, wet service, repetitive member factors, etc.)
    h. Bearing and anchorage details

    *Complete structural calculations for typical members and connections in accordance with referenced standards.*

5. **Steel joist girder truss plan requirements:**
    a. Owner and address of job
    b. Framing plans need to be provided with joist girder submittal, if they were not provided at the time of building review or if such did not provide the following information:
        i. Location and designation of all joist girders
        ii. Bearing and anchorage details
        iii. Design loads and location (dead, live, seismic, special, etc.) for each different joist girder
    c. Joist girder plans
        i. Depth and camber of girder trusses
        ii. Span of girder trusses
    d. Sketch showing girder truss geometry, connections, member sizes, and material properties
    e. Bridging sizes, locations, and requirements
    f. All applicable design loads including any panel point loads

    *Complete detailed typical joist girder member sizing calculations in accordance with referenced standards.*

**J. Fire-Resistive Details**

1. Design and listing of walls, ceilings, and roof systems (if required to be rated)
    a. Location and extent (horizontally and vertically)
    b. Materials used in the assembly
    c. Assembly listing source (UL or Table 719.1(2) item#…)
    d. Hourly rating (on plan and section)
2. Complete section through the assembly (including required attachments)
3. Firestopping and firesafing (comply with tested and listed firestop systems in IBC 711)
4. Opening protective assemblies (label, size limits in IBC section 714)
5. Draftstopping (IBC section 716)
6. Tested and listed fire resistant joint assemblies between fire resistance rated assemblies (IBC 712)
7. Calculated fire resistance per s. 720 including calculations and details of the assembly

**K. Building Envelope Thermal Calculations**

1. Building envelope thermal compliance calculations must be sent with the building plans
2. Note that these are considered a part of the building plan submission, not the HVAC plan; thus the building plans cannot be approved without this portion of the submittal
3. Comm chapter 63 worksheets found later in plan submittal kit may be used
4. Wisconsin also accepts thermal performance calculation generated by the **COMcheck-EZ** computer program for commercial buildings and residential building four stories and taller. Wisconsin accepts the use of **REScheck** program for shorter residential buildings. These programs are available at www.energycodes.gov

**L. Miscellaneous Calculations:**

1. Occupant load and exit width calculations, especially for large buildings
2. Grade plane, height and number of stories above grade plane
3. Sanitary fixture determination, minimum number of each fixture type
4. Hazardous materials control area quantities (if applicable)

*Sample Worksheets for most of these calculations can be found later in the plan submittal kit.*

**J. Lighting Plans**

Lighting plans are no longer required to be submitted for state plan review. However, lighting must still meet all applicable provision of the code. Lighting plans or calculations shall be kept at the jobsite for review by state or local inspectors.

1. Area controls [Comm 63.1050(1)]

2. Lighting reduction controls [Comm 63.1050(2)]
3. Daylight controls at windows and skylights [Comm 63.1050(3)]
4. Shut-off controls [Comm 63.1050(4)]
5. Display lighting controls [Comm 63.1050(5)]
6. Exterior lighting controls [Comm 63.1050(6)]
7. Hotel/motel/guest room [Comm 63.1050(7)]
8. Device performance requirements [Comm 63.1051]
9. Exterior lighting and power allowance [Comm 63.1041, 63.1042, and 63.1043]
10. Interior lighting [Comm 63.1044 and 63.1045]
    a. Interior lighting power allowance [Comm 63.1046]
        i. Complete building method [Comm 63.1047]
        ii. Area category method [Comm 63.1048]
        iii. Activity method [Comm 63.1049]
    b. Multiple interlocked systems and optional lighting reduction controls [Comm 63.1045(1)and(2)]
11. Track lighting [Comm 63.1045(4)(a)]
12. Incandescent sockets [Comm 63.1045(4)(c)]
13. Exit signs [Comm 63.1052]
14. Tandem wiring [Comm 63.1053]

**Building Submittal (alterations)**

**A. Tenant Space Plans In Multiple Tenant Buildings**

1. Schematic plan indicating existing conditions [this plan should show the complete existing facility]
    a. Complete building exiting plan showing all common exits and stairways
    b. All fire-resistive walls (ratings and locations)
    c. Location and number of public sanitary facilities
    d. Location of project within the building
2. Pertinent documents [such as code variances previously approved and condition of past plan approval that restrict this space or other spaces that affect or are affected by this space]
3. Building submittal requirements [all applicable items from previous building submittal list]

**Note**: Once the owner submits tenant alterations (e.g., for a new building "shell") to Safety and Buildings or a certified municipality (assuming all tenant spaces are under 100,000 cubic feet), then all subsequent submittals must be made to that same office. It is possible to later designate a "new" review office, but this will require a letter from the owner and may be expected to result in some delays of approvals for the submitter.

**B. Other Building Alteration Submittals**

In addition to the "general' and "occupancy" requirements shown on plans for the work being done, a *schematic* of "existing" conditions pertinent to the work being done must be provided on the submitted plan set.

***Schematic Plan of Existing Conditions Includes:***

1. Site plan information including property line locations
2. Occupancy/use (prior to alterations)
3. Existing/new construction clearly identified
4. Number of stories and roof elevations
5. Class of construction
6. Fire-resistive assemblies locations/ratings
7. Sprinkler protected areas
8. Existing floor plans, etc.
9. Exit and stairway locations
10. Existing barrier-free features (entrances, toilet facilities, etc.)
11. Also include a summary of any previously approved petitions for variance